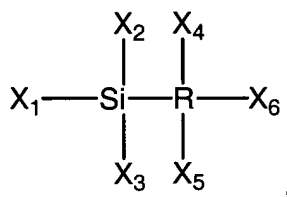


Claims:

1. A method for depositing a silicon-containing film, comprising:
delivering a silicon compound to a substrate surface;
reacting the silicon compound to deposit the silicon-containing film on the substrate surface; and
the silicon compound comprising a structure:



wherein $\text{X}_1\text{-X}_6$ are independently hydrogen or halogen, R is carbon, silicon or germanium and $\text{X}_1\text{-X}_6$ comprise at least one hydrogen and at least one halogen.

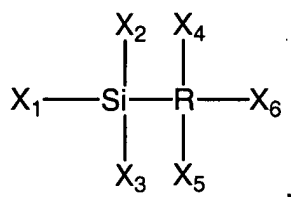
2. The method of claim 1, wherein R is silicon and $\text{X}_1\text{-X}_6$ are independently hydrogen or chlorine.
3. The method of claim 1, wherein the silicon-containing film comprises a material selected from the group consisting of silicon, silicon germanium, silicon carbon or silicon germanium carbon.
4. The method of claim 3, wherein the silicon-containing film is doped with an element selected from the group consisting of boron, phosphorus or arsenic.
5. The method of claim 3, wherein the silicon-containing film is deposited by atomic layer epitaxy, atomic layer deposition or chemical vapor deposition.
6. The method of claim 5, wherein a supplemental etchant is used while depositing the silicon-containing film and the supplemental etchant is selected from

the group consisting of HCl, Cl₂, HF, HBr, XeF₂, NH₄F, (NH₄)(HF₂), NF₃ and combinations thereof.

7. The method of claim 5, wherein the silicon-containing film has a thickness in the range from about 2.5 Å to about 10 μm.

8. The method of claim 7, wherein the at least one halogen is converted into an in-situ etchant.

9. A composition of matter comprising a structure:



wherein X₁-X₆ are independently hydrogen or halogen, R is carbon, silicon or germanium and X₁-X₆ comprise at least one hydrogen and at least one halogen and the proviso that R is not carbon when X₄, X₅ and X₆ are fluorine.

10. The composition of matter according to claim 9, wherein R is silicon and X₁-X₆ are independently hydrogen or chlorine.

11. The composition of matter according to claim 9, wherein X₁-X₆ comprise at least three hydrogens.

12. The composition of matter according to claim 9, wherein X₁-X₆ comprise at least three halogens.

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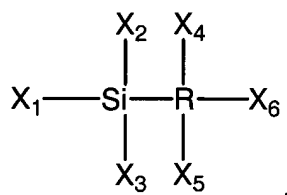
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13. The composition of matter according to claim 9, wherein X_1 - X_6 comprise at least one chlorine and at least one atom selected from the group consisting of fluorine and bromine.

14. The composition of matter according to claim 13, wherein X_1 - X_6 comprise at least three halogens.

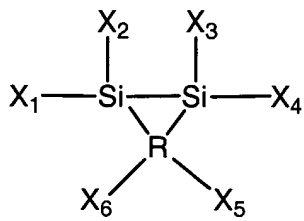
15. A composition of matter comprising a structure:

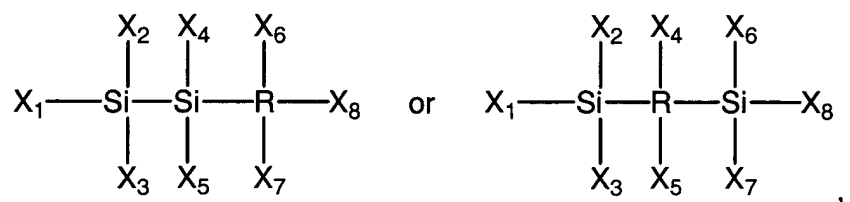


wherein X_1 - X_6 are independently hydrogen or halogen and R is germanium.

16. The composition of matter of claim 15, wherein X_1 - X_6 are each hydrogen.

17. A method for depositing a silicon-containing film, comprising:
delivering a silicon compound to a substrate surface;
reacting the silicon compound to deposit the silicon-containing film on the substrate surface; and
the silicon compound comprising structures:





wherein $\text{X}_1\text{-X}_8$ are independently hydrogen or halogen, R is carbon, silicon or germanium and $\text{X}_1\text{-X}_8$ comprise at least one halogen.

18. The method of claim 17, wherein R is silicon and $\text{X}_1\text{-X}_8$ are independently hydrogen or chlorine.

19. The method of claim 17, wherein the silicon-containing film comprises a material selected from the group consisting of silicon, silicon germanium, silicon carbon or silicon germanium carbon.

20. The method of claim 19, wherein the silicon-containing film is doped with an element selected from the group consisting of boron, phosphorus or arsenic.

21. The method of claim 19, wherein the silicon-containing film is deposited by atomic layer epitaxy, atomic layer deposition or chemical vapor deposition.

22. The method of claim 17, wherein $\text{X}_1\text{-X}_8$ comprise at least three hydrogen atoms.

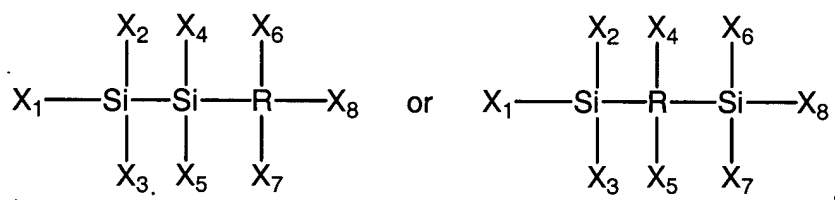
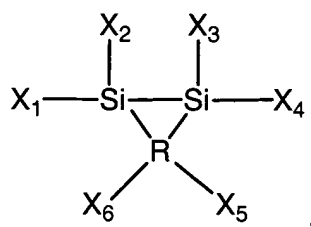
23. The method of claim 17, wherein $\text{X}_1\text{-X}_8$ comprise at least three halogen atoms.

24. The method of claim 21, wherein a supplemental etchant is used while depositing the silicon-containing film and the supplemental etchant is selected from the group consisting of HCl, Cl_2 , HF, HBr, XeF_2 , NH_4F , $(\text{NH}_4)(\text{HF}_2)$, NF_3 and combinations thereof.

25. The method of claim 21, wherein the silicon-containing film has a thickness in the range from about 2.5 Å to about 10 μm.

26. The method of claim 25, wherein the at least one halogen is converted into an in-situ etchant.

27. A composition of matter comprising structures:



wherein $\text{X}_1\text{-X}_8$ are independently hydrogen or halogen, R is carbon, silicon or germanium and $\text{X}_1\text{-X}_8$ comprise at least one halogen.

28. The composition of matter according to claim 27, wherein R is silicon and $\text{X}_1\text{-X}_8$ are independently hydrogen or chlorine.

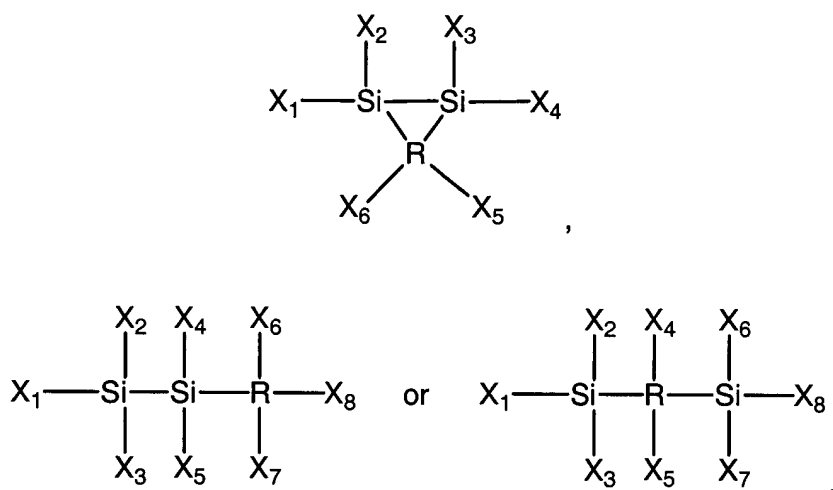
29. The composition of matter according to claim 27, wherein $\text{X}_1\text{-X}_8$ comprise at least three hydrogens.

30. The composition of matter according to claim 27, wherein $\text{X}_1\text{-X}_8$ comprise at least three halogens.

31. The composition of matter according to claim 27, wherein X_1 - X_8 comprise at least one chlorine and at least one atom selected from the group consisting of fluorine and bromine.

32. The composition of matter according to claim 31, wherein X_1 - X_8 comprise at least three halogens.

33. A composition of matter comprising structures:



wherein X_1 - X_8 are independently hydrogen or halogen and R is germanium.

34. The composition of matter according to claim 33, wherein X_1 - X_8 are each hydrogen.

35. A method for depositing a silicon-containing film, comprising:
delivering a silicon compound to a substrate surface;
reacting the silicon compound to deposit the silicon-containing film on the substrate surface; and
the silicon compound comprising structures of compounds 1-8, wherein X_1 - X_{10} are independently hydrogen or halogen, R is carbon, silicon or germanium and X_1 - X_{10} comprise at least one halogen.

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36. The method of claim 35, wherein R is silicon and X₁-X₁₀ are independently hydrogen, chlorine or fluorine.
37. The method of claim 35, wherein the silicon-containing film comprises a material selected from the group consisting of silicon, silicon germanium, silicon carbon or silicon germanium carbon.
38. The method of claim 37, wherein the silicon-containing film is doped with an element selected from the group consisting of boron, phosphorus or arsenic.
39. The method of claim 37, wherein the silicon-containing film is deposited by atomic layer epitaxy, atomic layer deposition or chemical vapor deposition.
40. The method of claim 39, wherein a supplemental etchant is used while depositing the silicon-containing film and the supplemental etchant is selected from the group consisting of HCl, Cl₂, HF, HBr, XeF₂, NH₄F, (NH₄)(HF₂), NF₃ and combinations thereof.
41. The method of claim 39, wherein the silicon-containing film has a thickness in the range from about 2.5 Å to about 10 μm.
42. The method of claim 41, wherein the at least one halogen is converted into an in-situ etchant.
43. A composition of matter comprising structures of compounds 1-8, wherein X₁-X₁₀ are independently hydrogen or halogen, R is carbon, silicon or germanium and X₁-X₁₀ comprise at least one halogen.
44. The composition of matter according to claim 43, wherein R is silicon and X₁-X₁₀ are independently hydrogen or chlorine.

45. The composition of matter according to claim 43, wherein X_1 - X_{10} comprise at least one chlorine and at least one atom selected from the group consisting of fluorine and bromine.
46. The composition of matter according to claim 45, wherein X_1 - X_{10} comprise at least three halogens.
47. A composition of matter comprising structures of compounds 1-8, wherein X_1 - X_{10} are independently hydrogen or halogen and R is germanium.
48. The composition of matter according to claim 47, wherein X_1 - X_{10} are each hydrogen.
49. A method for depositing a silicon-containing film, comprising:
delivering a silicon compound to a substrate surface;
reacting the silicon compound to deposit the silicon-containing film on the substrate surface; and
the silicon compound comprising structures of compounds 9-32, wherein X_1 - X_{12} are independently hydrogen or halogen and R is carbon, silicon or germanium.
50. The method of claim 49, wherein R is silicon and X_1 - X_{12} are independently hydrogen or chlorine.
51. The method of claim 49, wherein the silicon-containing film comprises a material selected from the group consisting of silicon, silicon germanium, silicon carbon or silicon germanium carbon.
52. The method of claim 51, wherein the silicon-containing film is doped with an element selected from the group consisting of boron, phosphorus or arsenic.

53. The method of claim 51, wherein the silicon-containing film is deposited by atomic layer epitaxy, atomic layer deposition or chemical vapor deposition.
54. The method of claim 49, wherein X_1 - X_{12} comprise at least three hydrogen atoms.
55. The method of claim 49, wherein X_1 - X_{12} comprise at least three halogen atoms.
56. The method of claim 53, wherein a supplemental etchant is used while depositing the silicon-containing film and the supplemental etchant is selected from the group consisting of HCl, Cl_2 , HF, HBr, XeF_2 , NH_4F , $(NH_4)(HF_2)$, NF_3 and combinations thereof.
57. The method of claim 53, wherein the silicon-containing film has a thickness in the range from about 2.5 Å to about 10 μm .
58. The method of claim 57, wherein the at least one halogen is converted into an in-situ etchant.
59. A composition of matter comprising structures of compounds 9-32, wherein X_1 - X_{12} are independently hydrogen or halogen, R is carbon, silicon or germanium and X_1 - X_{12} comprise at least one halogen.
60. The composition of matter according to claim 59, wherein R is silicon and X_1 - X_{12} are independently hydrogen or chlorine.
61. The composition of matter according to claim 59, wherein X_1 - X_{12} comprise at least three hydrogens.

62. The composition of matter according to claim 59, wherein X_1 - X_{12} comprise at least three halogens.

63. The composition of matter according to claim 59, wherein X_1 - X_{12} comprise at least one chlorine and at least one atom selected from the group consisting of fluorine and bromine.

64. The composition of matter according to claim 63, wherein X_1 - X_{12} comprise at least three halogens.

65. A composition of matter comprising structures of compounds 9-32, wherein X_1 - X_{12} are independently hydrogen or halogen and R is germanium.

66. The composition of matter according to claim 65, wherein X_1 - X_{12} are each hydrogen.